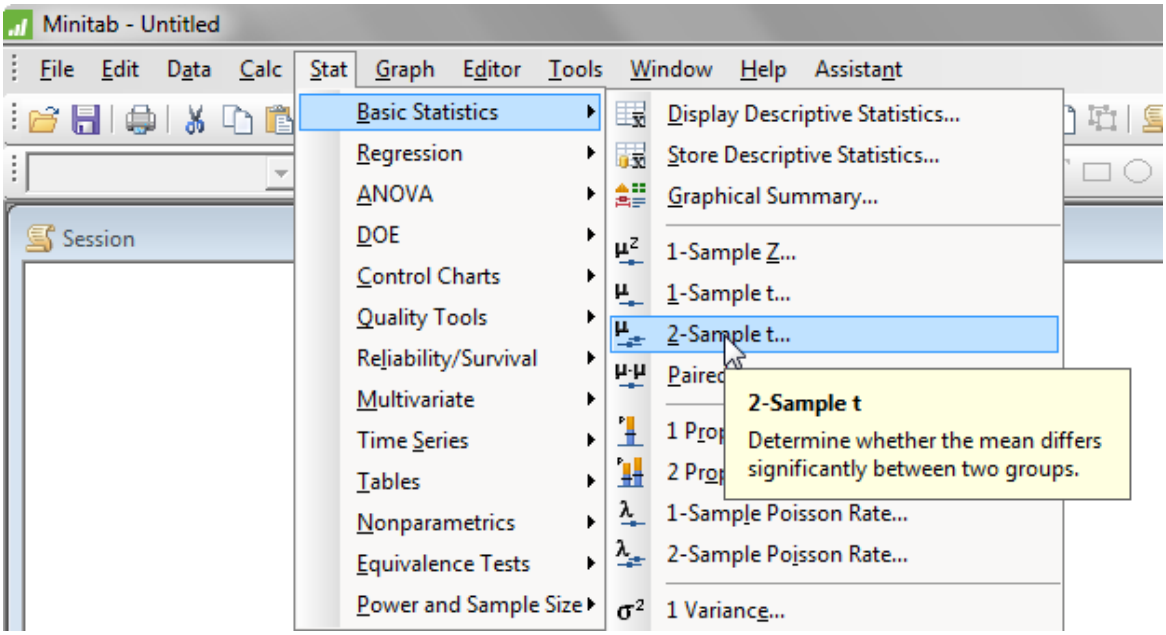
2-Sample-t command in Minitab 17

for confidence intervals and hypothesis tests on two means

Read the 1-sample-t document before reading this, because there are many similarities.



There are three ways that the data can be read in:

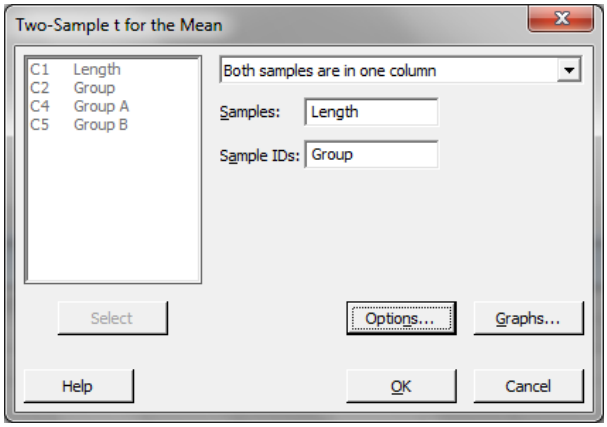
- Both samples are in one column
- Each sample is in its own column
- Summarized data

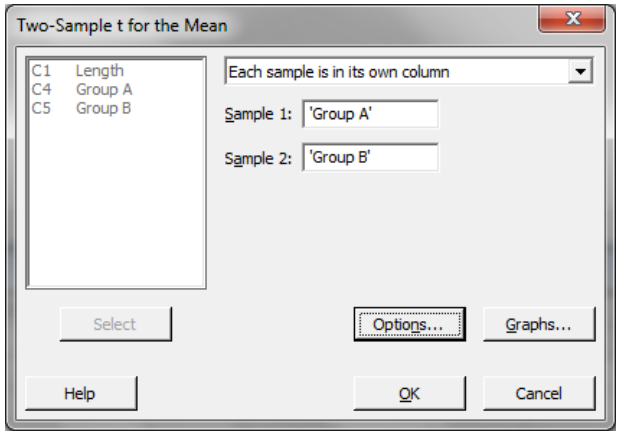
Here is the worksheet with two different sets of data.
Columns A and B have both samples in one column.
Columns D and E have each sample in its own column.

Worksheet 1 ***

	C1	C2-T	C3	C4	C5	C
	Length	Group		Group A	Group B	
1	3.1	Control		103	92	
2	2.9	Control		68	126	
3	3.7	Treatment		79	114	
4	3.1	Control		106	106	
5	4.9	Treatment		72	89	
6	4.7	Treatment		121	137	
7	3.2	Treatment		92	93	

Here is how we read in the data from each of those.

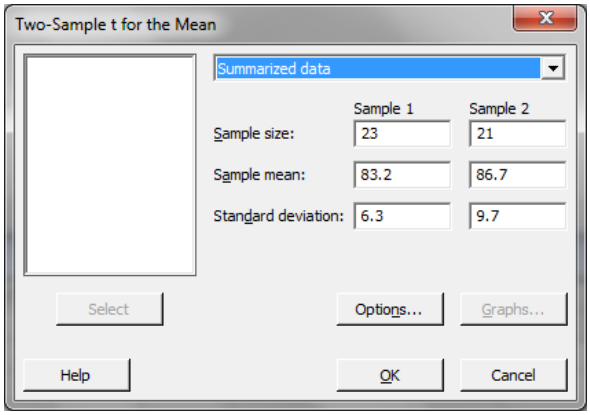


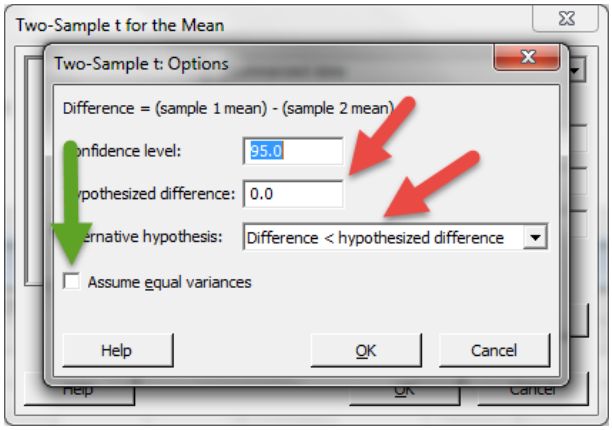


Below left is how to enter summarized data.

Below right is how to test Ho: Mean 1 = Mean 2 versus Ha: Mean 1 < Mean 2. The screen on the right is the same no matter how the two-sample data was entered.

Notice that we DO NOT check the box for equal variances. (See the green arrow.)





Below is the output. Notice the degrees of freedom the software computed is different from that we use when doing the calculation by hand. This is a more accurate answer.

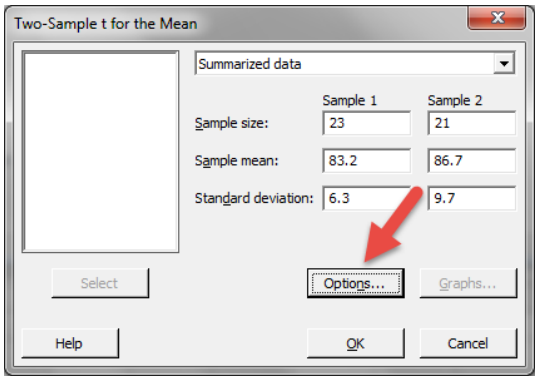
Two-Sample T-Test and CI

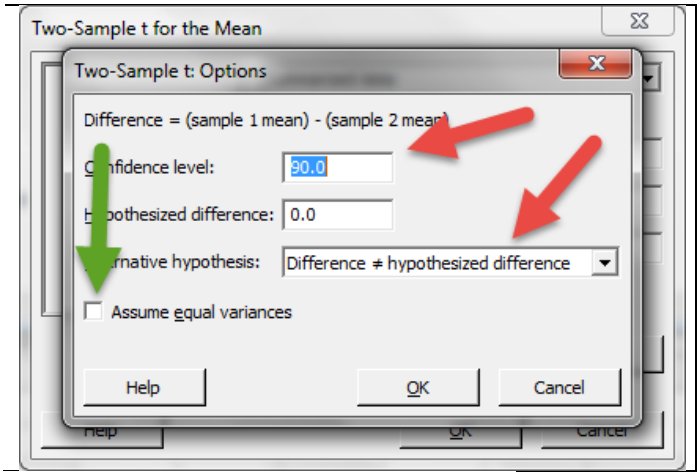
Sample	N	Mean	StDev	SE Mean
1	23	83.20	6.30	1.3
2	21	86.70	9.70	2.1

Difference = μ (1) - μ (2)
Estimate for difference: -3.50
95% upper bound for difference: .72
T-Test of difference = 0 (vs <): T-Value = -1.40 P-Value = 0.085 DF = 33

To form a 90% confidence interval for the difference of Mean 1 and Mean 2 we do three things

- Enter the 90%
- Make the alternative hypothesis statement two-sided
- Do not check the "Assume equal variances" box





Two-Sample T-Test and CI

Sample	N	Mean	StDev	SE Mean
1	23	83.20	6.30	1.3
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```
Difference = μ (1) - μ (2)
Estimate for difference:  -3.50
90% CI for difference:  (-7.72, 0.72)
T-Test of difference = 0 (vs ≠): T-Value = -1.40  P-Value = 0.169  DF = 33
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So our output gives us the 90% confidence interval of (-7.72, 0.72) .